

AUSTRAL HEPATICAE XX.

NEW SPECIES OF HYGROLEMBIDIUM (LEPIDOZIACEAE)

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The Lepidoziaceae are a large and diverse family that contains some 7 subfamilies. One of these subfamilies, the Lembidioideae, is composed of four genera--Isolembidium, Lembidium, Hygrolembidium and Chloranthelia. The following new taxa are part of a monographic study of subf. Lembidioideae; the names are published separately to make them immediately available for use.

Hygrolembidium rigidum Schust. & Engel, sp. nov.

Plantae subisophyllae, carnosae et fragiles. Folia (2)3-4-stratosa basin versus, cellula epidermalis in sectione transversali magnitudine cellulis internis  $\pm$  aequalis; cellulae distales usque ad tertiam partem diametri cellularum basaliu folioru adaequantes; margines foliorum saepe repandi vel repando-dentati, papillae mucosae frequentes; superficies folioru papillosa. Perianthum conspicue longi-fusiforme, ore crenulato. Seta 10-14 seriebus cellularum epidermalium munita.

Holotype: New Zealand, South Island., Fiordland Natl. Park, Mt. Burns, Hunter Mts., 4500-5000 ft., Schuster 84-101 (F)(isotype: CHR).

Plants fleshy and brittle, subisophyllous or underleaves only moderately smaller than leaves on the erect,  $\pm$  triquetrous shoots, intense pure green, the leafy shoots to 1.8 mm wide. Branching common, mostly ventral-intercalary, occasionally lateral-intercalary, very rarely of Frullania-type; stolons sporadic or occasional, only rarely forming a freely branched prostrate system from which arise the erect leafy shoots. Stem very thick for plant size, formed of up to ca. 50 rows of cortical cells that are thin-walled (except free walls faintly thickened). Rhizoids occasionally toward base of erect, leafy shoots, from basal cells of underleaf or leaf or from stem at immediate base of foliar tissue; rhizoids of stolons similar in origin to those of leafy branches. Leaves firm, rigid, opaque, often  $\pm$  keeled below, in cross section toward base (2)3-4-stratose in intramarginal sector, the leaves remaining polystratose to at most within 2 cells of margin, the epidermal cells of leaf averaging  $\pm$  the same size as internal cells; leaf insertion transverse to feebly succubous, the leaf orientation

transverse; leaves deeply concave to subcupulate to subcanaliculate, broadly ovate-triangular to reniform-orbicular to oboate; apex somewhat narrowed, usually with a sharp, short incision or at least retuse, sometimes 3-4-lobulate and/or dentate, often loosely folded or canaliculate; lamina margins entire or often repand to repand-dentate, slime papillae frequent. Cells showing gross size increase from apical and marginal areas (here 20-25 x 24-30 u to 24-35 x 28-48 u) to base (here 40-60 x 55-85 u to 60-85 x 70-100 up to 45-60 x 100-120 u); cell walls thin throughout, distally with at most medium-sized trigones; cuticle obscurely to distinctly papillose throughout leaf, only the median or median-basal cells sometimes smooth. Oil-bodies uniformly lacking. Underleaves 0.4-0.65(0.75) as large as leaves, ovate-triangular to orbicular-reniform to broadly ovate-reniform, usually folded-canaliculate, 0.6-1.8x as wide as stem; apex often retuse or shallowly bifid; lamina margins entire or repand, often with slime papillae.

Dioecious. Androecia on both lateral- and ventral-intercalary branches; antheridia single per bract, the stalk bistratose throughout or unistratose but with bistratose areas. Gynoecea mostly ventral in origin, occasionally lateral; bracts and bracteoles nearly identical, sheathing only basal ca. 0.25 of perianth, somewhat larger than leaves, hyaline, the apex blunt to narrowly truncate or subacute, unlobed, with armature as in perianth mouth; lamina margins dentate to ciliate, slime papillae common. Perianth exceptionally long for plant size, long-fusiform, cylindrical below and bluntly 3(4)-gonous above, the mouth crenate-denticulate with thin-walled, laterally connate, finger-like cells that are mostly 3.5-5:1; perianth 3-5(6)-stratose at base.

Seta with 10-14 rows of epidermal cells. Capsule long-elliptic, the wall 3-(very locally 4) stratose. Epidermal cells with longitudinal and some transverse walls with thin to moderately thickened continuous sheets of wall material but with nodular thickenings weak or lacking; innermost layer with radial (vertical) bands nodular to spur-like in surface view, varyingly extended tangentially to form incomplete to complete, semiannular bands. Spores 12.4-13.5 u, exine with low, delicate papillose and simple or sometimes furcate vermiculate markings. Elaters 2-spiral, 8.6-9.6 u in diameter; spirals 2.9-3.8 u wide.

Diagnostic for this species is the combination of a) the basal cells of the leaf to 3X the diameter of distal cells; b) the leaves in basal cross section 3-4-stratose and with epidermal cells averaging  $\pm$  the same size as internal cells; c) the lack of oil-bodies; d) the rather large underleaves that are often similar to the leaves, so that leafy shoots are almost trigonous; e) the papillose leaf cuticle; f) the repand to repand-dentate leaf margins; and g) the strikingly long fusiform perianths.

Hygrolembidium triquetrum Engel & Schust., sp. nov.

Plantae subisophyllae vel  $\pm$  isophyllae, triquetrae, admodum carnosae et fragiles. Caulis cortex bene evoluta, cellulae corticis 1-2-stratosae, multo minores quam cellulae medullares; cellulae corticales leptodermiae, cc. 65-seriatae. Folia 5-7-stratosa basin versus, cellula epidermiali in sectione transversali plerumque cellulis internis diametro minoribus; cellulae foliorum basaliu diametro cellulis distalibus subaequales; margines foliorum repandi vel repando-dentati, papillae mucosae frequentes; superficies foliorum levis. Stipes antheridii bicellulari-seriatus.

Holotype: New Zealand, South Is., Westland Prov., Mt. Aspiring Natl. Park, below and W. of Mt. Armstrong, SSW of Mt. Brewster, 1250-1450 m., Engel 17790 (F)(isotype: CHR).

Plants exceedingly fleshy and brittle, subisophyllous to  $\pm$  isophyllous on the erect triquetrous shoots, pure green, the leafy shoots to 2.4 mm wide. Branching copious, both ventral- and lateral-intercalary; stolons common, usually not forming a freely branched prostrate system from which arise the erect, leafy shoots. Stem very thick for plant size, the cortex in ca. 65 rows of thin-walled cells, well differentiated, in 1 or locally 2 layers. Rhizoids often toward base of erect, leafy shoots, from basal cells of underleaf or leaf or from stem at immediate base of foliar tissue; rhizoids of stolons similar in origin to those of leafy branches. Leaves firm, rigid, brittle, opaque, often  $\pm$  keeled below, in cross section toward base 5-7-stratose in intramarginal sector, the epidermal cells of leaf averaging considerably smaller than internal cells; leaf insertion transverse to faintly succubous, the leaf orientation transverse; leaves moderately concave to cupulate to canaliculate, oblate to reniform; apex variable, often broadly rounded to subtruncate, at times somewhat narrowed (particularly on smaller leafy branches), entire or sometimes with a few small teeth, sporadically retuse; lamina margins entire or often repand to repand-dentate, slime papillae frequent. Cell walls thin to slightly thickened, those of apical sector with at most medium-sized trigones, those toward base leptodermous, with trigones small or absent; cells of apical sector subquadrate, 23-31  $\mu$  wide and long; median cells 22-31  $\mu$  wide, 26-37(42)  $\mu$  long; basal cells 22-32  $\mu$  wide, 36-52  $\mu$  long; cuticle uniformly smooth. Oil-bodies not seen. Underleaves similar to leaves in form and often not or hardly differentiated from them, 0.5-0.75 as large as leaves to at times subequal to them, ovate to subreniform, (0.8)1-1.3X as wide as stem; apex plane to (often) hood-like, variable, undivided and entire or retuse to shallowly bifid; lamina margins entire or repand-dentate to dentate, often with slime papillae.

Dioecious. Androecia on both lateral- and ventral-intercalary branches, subjulaceous, vermiform, often crowded toward base of erect, leafy shoots, also present on stolons; antheridia single per bract, the stalk biseriate. Gynoecia not seen.

This species is related to H. rigidum but may be distinguished from it by a) the leaves 5-7-stratose in basal cross section and with the epidermal cells averaging smaller in diameter than internal cells; b) the leaf cell width remaining + the same from leaf apex to base; and c) the smooth leaf cuticle.